EMB

24.

UNITED STATES

DEPARTMENT OF AGRICULTURE

LIBRARY
STATE PLANT BOARD

9 Lead arsenate + bentonite
vis pine shoot moth.

BUREAU OF
ENTOMOLOGY AND PLANT QUARANTINE
NEWS LETTER

VOLUME I

No. 5

[illegible]

Digitized by the Internet Archive
in 2016

https://archive.org/details/newsletter1519wash

UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

NEWS LETTER

FOR OCTOBER 1934

Vol. I, No. 5 (Not for publication) December 1, 1934

LEADERS DISCUSS WORK OF BUREAU

During the week of November 12-17 a series of full-day conferences was held in the office of the Chief of Bureau. These conferences were attended by the Division leaders of the Bureau and by the assistant leaders of the divisions whose work is headquartered in Washington. Each leader gave an informal talk on the work of his Division, which was followed by a general discussion of the material presented.

Some of the conferences were also attended by M. S. Eisenhower, Director of Information of the Department, and by W. W. Stockberger, Director of Personnel and Business Administration, both of whom addressed the conference regarding the lines of work with which they are associated. L. O. Howard and C. L. Marlatt also attended certain sessions and participated in the discussion.

On Wednesday, November 14, members of the conference had luncheon with the Secretary of Agriculture. At this time short talks were made by various individuals, discussing certain phases of the Bureau's work.

FRUIT INSECT INVESTIGATIONS

Dried fruit beetle found in grape pomace.--In samples of fermenting pomace examined by Dwight F. Barnes, of the dried-fruit insect laboratory at Fresno, Calif., in October, an average of 84 adults and more than 513 larvae of Carpophilus hemipterus L. per pound were found. The temperature of the pomace 4 inches below the surface, where the samples were taken, ranged from 100° to 109° F. Pupation was most abundant in the soil beneath the edges of the piles.

Injury by raisin moth larvae to three varieties of raisins.--Heber C. Donohoe, Fresno, Calif., reports that in a study of feeding injury by Ephestia figulilella Greg., he collected samples of raisins from trays stacked in vineyards and allowed the infestation in the samples to reach the stage of full-grown larvae. He then examined 12,376 raisins of three varieties for feeding injury and compared the number of injured berries with the number of larvae in the samples. The total number of injured berries, as compared with the infestation that developed in the samples, indicated a feeding per larva as follows: Thompson Seedless, 21.7; Sultana, 20.9; and Muscat, 9.2.

MEXICAN FRUIT FLY CONTROL

Mexican fruit fly still absent in lower Rio Grande Valley.--No specimens of the Mexican fruit fly were taken in the Texas groves, either in traps or in fruit; however, the operation of some 8,000 traps resulted in the taking of 8 adult specimens of Anastrepha fraterculus Wied., 1 of A. serpentina Wied., and 71 of A. pallens Coq. The pupation tray studies were continued throughout October but the only Anastrepha emerging were A. pallens, which were infesting coma berries. No Anastrepha were taken in the traps on the Mexican side of the river. Larvae of A. ludens, A. fraterculus, A. striata, and Rhagoletis sp. were recovered from imported fruits exposed for sale in the markets of Matamoros. The night office at Edinburg, Tex., which is the outlet of the valley, was opened near the middle of the month for the purpose of permitting trucks clearing the valley during the night hours. This office issues permits only to trucks that have obtained their cargoes from permitted packing houses, thereby relieving the various district inspectors of this night work.

DATE SCALE ERADICATION

Summary of October work.--From October 1 to 13 the crew at Indio, Calif., was in the Imperial Valley assisting in the inspection of the Reed Garden. During the remainder of the month the planting belonging to the Barker Brothers in the Indio district was inspected from the ground, and inspection of the smaller places in the Coachella district was begun. The scout crew covered this district from the ground and from ladders in February 1933 and from the ground only in September 1933. No scale has been found in this district since September 1930. In the Reed Garden the only planting that has shown scale during the fiscal year 1934 was carefully inspected and no scale was found. Three palms were found infested in this garden during the inspection of February 5 to 13, 1934. Since that time three inspections have been made--February 13-17, 1934; May 1934; and October 1934, and only dead scale on a palm previously treated was found. A total of 1,424 palms in the city of Calexico and in districts number 3 and number 4 were inspected from the ground, and 74 palms in the Noah Williams Garden were inspected from the ground and from ladders. In the Phoenix, Ariz., district 167 palms were inspected from the ground and a quarter of a section scouted for unlisted palms. In the Yuma, Ariz., district 469 palms were inspected from the ground.

CEREAL AND FORAGE INSECT INVESTIGATIONS

High vacuum kills flour beetle.--R. T. Cotton, Manhattan, Kans., reports that while conducting experiments on the vacuum fumigation of flour products, a considerable discrepancy was noted between results obtained with a small tank and those obtained with a large tank. The only difference in the method of operating the two tanks was the degree of vacuum obtained. With the large tank it was impossible to obtain more than a 26-inch vacuum, whereas with the small tank a vacuum of 29 inches could be drawn. An investigation of the effect of different degrees of vacuum revealed some interesting facts. In a 14-cubic foot vault loaded with 48-pound bags of flour in an initial vacuum of 26 inches, 3/4 ounce of liquid hydrocyanic acid for an exposure of 1 hour was required to give a 100-percent kill of confused flour beetles (Tribolium confusum Duv.) buried in the middle of the bags. With an initial vacuum of 28 inches, a dosage of 1/4 ounce HCN gave a 100-percent kill, and with an initial vacuum of 29 inches a dosage of only 1/8 ounce gave a perfect kill. Further investigations showed that the high vacuum alone had a marked effect on the flour beetles. A vacuum of 29 inches held for 4 hours gave a 100-percent kill, whereas a 28-inch vacuum did not. This effect of high vacuum on insects was observed by E. A. Back and Mr. Cotton several years ago. Some insects are quite resistant to high vacuum; however, the flour beetle is quite susceptible.

Hessian fly builds up population quickly.--E. T. Jones, Manhattan, Kans., reports that, although there is no general outbreak of hessian fly at these points, the fortuitous planting of test plots in favorable situations at Parsons, Kans., and Springfield, Mo., and an artificial infestation at Manhattan, Kans., have resulted in high infestations in the resistance test plots. Superficial examination of these plots has disclosed relatively heavy infestations of fly in practically every one of the 440 varieties, hybrids, and strains of wheat being tested for fly resistance at Manhattan and Parsons and about 300 being tested at Springfield. In some of the susceptible checks virtually 100 percent of the plants are infested. This is in striking contrast to the light infestations of the past few years in the resistant test plots at Wichita, Kans., where infestations in susceptible checks seldom exceeded 15 percent.

Drought controls pea aphid.--According to Mr. Jones, the drought and heat of the past summer have reduced the population of pea aphid (Illinoia pisi Kalt.) to a minimum at Manhattan, Kans. Sweepings made in many fields of alfalfa and vetch scattered through a number of counties have revealed but one infested field. This infestation, found in the shelter of a thick hedge, was so light that more than an hour's sweeping was required to collect 50 aphids. Apparently the same factors that have reduced the numbers of the pea aphid have not affected the abundance of the common wheat aphids, which seem to be more abundant than usual.

Grasshopper flights.--F. A. Morton, Bozeman, Mont., reports that daily records were kept of grasshopper flights during July and August at Langdon and Mohall, N. Dak., and during a part of July at Grassrange, Mont. Similar records were kept at Langdon and Mohall in 1933, and data for the two summers are tabulated below. Observations were made three times daily and the flight of maximum intensity is the one reported for a given day.

Location	Period	Days on which the flight was--				
		Light	Light to: moderate	Moderate	Moderate to: heavy	Heavy
		Number	Number	Number	Number	Number
Mohall--------	July 1-Aug. 28, 1933	16	3	3	2	4
Do---------	July 1-Aug. 16, 1934	16	2	3	3	4
Langdon------	July 14-Aug. 31, 1933	20	7	1	5	0
Do---------	July 1-Aug. 31, 1934	20	2	1	0	0
Grassrange--	July 10-29, 1934	9	2	0	0	2

As the observation period at Langdon did not begin until July 14 in 1933, it is certain that some of the heavier flights were not recorded and that there has been a decrease in aerial movements at that point since 1933. In 1934 most of the flights were to the south, southeast, or southwest, indicating considerable migration from nearby infested areas in Canada.

Insects reduce alfalfa-seed production.--Three insects were found to have a great bearing on the yield of alfalfa seed in Arizona during the past season. These insects were Lygus sp., a pentatomid, Chlorochroa sayi Stal., and a field cricket. The field cricket situation was especially noticeable in the Yuma section and injury to the second crop of seed was very heavy. L. L. Stitt, Tempe, Ariz., made some rather definite observations in the Yuma Valley and tabulated the percentage of injury as noticed in nine fields on each of the three major groups of insects affecting the yield of alfalfa seed at that point. His observations are as follows: Nine seed samples were collected for emergence of Bruchophagus funebris How. and its parasites, Tetrastichus bruchophagi Gahan, Liodontomerus sp., and Trimeromicrus maculatus Gahan; for brown seed injury; and for infestation by B. funebris. Some of the insects that damaged the seed crop were a species of Lygus, pentatomids (especially Chlorochroa sayi Stal.), and a field cricket. No determination has been made of this cricket, but it appears to be the common field cricket (Gryllus assimilis Fab.). Brown seeds are not productive and reduce the seed yield of alfalfa. The nine samples collected in the Yuma Valley were checked by making percentage counts. Brown seeds were very numerous, ranging from 24.88 to 97.29 percent, with an average of 57.08 percent. Chlorochroa sayi was abundant in the Yuma Valley. Both C. sayi and C. ligata Say have been observed feeding on the seed pods. Seeds shelled out of the alfalfa pods showed sucking injury. Sucking insects may not be responsible for all brown seeds but are a cause of reduced seed yields.

Hessian fly parasite found in Oregon.--The parasite Centrodora speciospissima (Girault), hitherto known only from the Eastern and Middle Western States, was reared from a hessian fly puparium collected near Forest Grove, Oreg., by Max M. Reeher. Six females and 1 male of this species emerged on September 20 and were determined by A. B. Gahan. This is the first record of the occurrence of this parasite in Oregon. The program for the introduction of the hessian fly parasite called for the attempted introduction of C. speciospissima into the Pacific Northwest. This is now unnecessary.

JAPANESE AND ASIATIC BEETLE INVESTIGATIONS

Japanese beetle attractants.--In a report on the control of the adult beetle by means of mechanical traps, F. W. Metzger, Moorestown, N. J., says: "Tests conducted during the past summer indicate that geraniol of very high quality is not essential for maximum attraction to the beetle. The cheap grades, known as technical or soap geraniol, vary widely in composition and not all such grades are satisfactory for use in attracting the Japanese beetle. A certain percentage of esters and aldehydes in geraniol does not inhibit attraction, but when these substances are present in the proper amounts they actually increase attraction. None of the constituents of geraniol are more than 60 percent as attractive as the recommended combination of geraniol and eugenol. When combined with eugenol at the usual rate, citronellol and geranyl acetate are more attractive than when used alone. The addition of eugenol, however, has very little influence on the attraction of citronellol, geraniol terpenes, or citronella oil. This investigation has made it possible to draw up standards for a cheap grade of geraniol which can be met by all manufacturers of this substance. Geraniol meeting these specifications is more attractive to the beetle than are the more expensive grades costing in quantity approximately $1.50 per pound, whereas the cheaper material can be obtained for about $1 per pound."

Stomach poisons for adult Japanese beetle.--According to W. E. Fleming and F. E. Baker, Moorestown, "In the report on Paris Green and Its Homologs as Insecticides for the Japanese Beetle, the effectiveness of the materials was expressed as the coefficient of the insecticidal action of lead arsenate, which was used as a standard insecticide. The relation between the coefficient of effectiveness of the materials and the concentration can be expressed mathematically by the equation

$$Y = a + b \cdot \log X$$

where Y is the coefficient of effectiveness, $\log X$ is the logarithm of the concentration, and a and b are constants. In a statistical evaluation of the coefficients, it appeared that copper crotono-arsenite was not significantly different from paris green and copper palmito-arsenite, but appeared to be significantly more effective than copper lauro-arsenite, rapeseed oil green, copper stearo-arsenite, soybean oil green, and copper oleo-arsenite. Paris green without a sticker was the most variable in its effectiveness. The addition of flour or an oil to the paris green reduced the variation in the insecticidal results. It was found that rapeseed oil green increased in effectiveness only to a slight extent by increments in concentration, and the greatest modification in effectiveness with change in concentration was obtained with copper crotono-arsenite, copper palmito-arsenite, and paris green with summer oil. There appeared to be no correlation between the water-soluble arsenious or the total arsenious oxide content of these materials and their effectiveness as insecticides. Paris green, copper crotono-arsenite, and copper palmito-arsenite, the most effective of these materials, prevented extensive feeding by the beetles when used at the rate of 8 pounds to 100 gallons of water. Most of the other materials had to be used at the rate of 16 pounds to 100 gallons to accomplish this result.

However, paris green and its homologs caused some injury to foliage at concentrations below that at which the beetles were largely deterred from feeding. It may be concluded from this investigation that paris green and its homologs are inferior to acid lead arsenate in killing the Japanese beetle, and in their present form cannot be used to protect foliage from attack by this insect without causing spray injury."

Derris and the Japanese beetle.--In the report on Derris and Its Constituents as Insecticides and Repellents against the Japanese Beetle, along with Tests with Miscellaneous Materials, Messrs. Fleming and Baker state that "the results were obtained under artificial conditions of heavy infestation in the constant-temperature rooms, according to the procedure outlined in Jour. Agr. Research 48:115-130; 49:39-44, 1934, which was the same as that used in the study of paris green and its homologs. Under these conditions complete protection was given to the fruit and foliage of Yellow Transparent apples by the application of sprays containing derris or rotenone. Lime sprays did not protect the fruit from attack, although the feeding on the foliage was somewhat reduced. Beetles fed to only a limited extent on fruit sprayed with acid lead arsenate. It was demonstrated that hellebore and pyrethrum have no value as stomach poisons or as repellents against the Japanese beetle. Derris is a weak stomach poison but a definite repellent. The repellent action of derris appears to be due to the rotenone and deguelin. Toxicarol, tephrosin, and the resinous residue, after the crystalline materials have been extracted, appear to be of no value as repellents. Deguelin was found to be equal to neutral potassium oleate soap, when tested according to the procedure outlined in Jour. Agr. Research 49:29-38, 1934, and rotenone was 2.3 times as effective. Derris used alone was only about one-third as effective, but when 0.125 percent potassium coconut oil soap, an amount below that effective against the beetle, was added, derris became 1.76 times more effective than the standard. Exposure to ultraviolet light definitely decreased the effectiveness of derris, rotenone, and deguelin as repellents. The addition of sodium silicate solutions to derris sprays destroyed the repellent value of the deposit on foliage. Derris is readily washed from foliage. The action of rain in the field is believed to be one of the most important, if not the most important factor, in limiting the effectiveness of derris sprays. Several materials were tested as stickers for derris, the most promising being a paraffin emulsion."

JAPANESE BEETLE CONTROL

Chain store fined for violating Japanese beetle quarantine.--Finding of a Japanese beetle in a quart of huckleberries being prepared for a pie by the proprietress of a tea room in Warrenton, Va., culminated in a fine of $125 being imposed upon The Great Atlantic & Pacific Tea Company of New Jersey for illegal transportation of uncertified huckleberries from their District of Columbia warehouse to their Warrenton store. Some of the huckleberries moved to Warrenton were from Hammonton, N. J., a section densely infested with the beetle. Thirty-six traps set in Warrenton this year caught 10 beetles.

Extensive heeling-in areas fumigated.--Nurseries desiring certified heeling-in or plunging areas in the open field after August 1 are obliged to treat the surface soil with a fumigant. Accordingly, a number of nurseries recently fumigated rather extensive areas with raw carbon disulphide. At a large nursery in New Jersey a total of 10,194 square feet of plunging area was treated with a total dosage of 612 pounds of fumigant. Sufficient canvas was available to treat approximately 2,700 square feet at one time. After 48 hours the tarpaulin was removed and another section was treated. In this method of fumigation, carbon disulphide is uniformly distributed over the surface of the soil by applying it in holes 12 inches apart and from 1 to 2 inches deep, putting 21 cc in each hole. As soon as the fumigant is applied the ground is immediately covered with a gas-proof cover. In treating 2,742 square feet of surface soil in a heeling-in area in the blueberry-growing section of New Jersey, carbon disulphide emulsion was used. With this method, specified dosages of dilute carbon disulphide emulsion are poured into galvanized-iron collars forced into the ground over the entire treated surface. Other fumigation activities included carbon disulphide treatment of about 25 tons of potting and bench soil for a nursery in Chester County, Pa.

Cut-flower inspection discontinued.--As provided in the quarantine regulations, the inspection requirements on the movement of cut flowers from the Japanese beetle regulated zone were removed on and after October 16. This permitted the dismissal of eight temporary inspectors engaged in this work. The last beetles were found on cut flowers inspected in Philadelphia wholesale houses on October 4. Cool weather probably accounted for the few adults surviving. The last beetle found by the inspection force was collected in a field near Easton, Pa., on October 17.

New gypsy moth activities in New England.--Christmas tree cutting in Vermont started during the last week in October, will increase rapidly during the first half of November, and continue through that month. The recent revision of the gypsy moth quarantine regulations eliminated from the regulated area a considerable portion of Vermont from which Christmas trees are shipped in quantity. This will reduce the volume of trees inspected and certified. The cutting of balsam trees in Maine will start after the first good freeze, probably early in November. These seasonal activities add to the inspection work of the district inspectors. From 3 to 4 inches of snow fell on the mountains at Rutland, Vt., late in October. On October 22, the Granite State Quarry at Concord, N. H., resumed the cutting of paving blocks. This is the first paving cut in Concord for 3 years. About 25,000 blocks will be cut and shipped under gypsy moth certification. Also, some 50,000 blocks that have been piled in the open for 3 years will be shipped under certification. Large numbers of egg clusters will probably be found when the old blocks are handled.

More road-inspection stations in New England.--Ten additional vehicular-inspection stations were established between October 15 and 19 on important highways carrying traffic from the lightly infested gypsy moth area. Schedules call for operation of four of the posts for 12 hours daily. The remaining six posts will be operated on a staggered daily schedule of 6 hours each. Sixteen men are assigned to the new stations. Shortly after the opening of a post at Cheshire, Conn., a gypsy moth egg cluster was found on maple cordwood being transported from Pelham, Mass., to Port Chester, N. Y.

Autumn defoliation ends scouting for Dutch elm disease.--Scouting in the vicinity of the elm found infected with the Dutch elm disease at Old Lyme, Conn., was concluded on October 20, due to unfavorable scouting conditions. Four Federal and two State scouts completed an area 5 to 10 miles in width bordering Long Island from Guilford, Conn., to the Rhode Island line. Samples were taken from 163 suspected trees. Of those now cultured, none have been found infected with the Dutch elm disease. The European elm bark beetle (*Scolytus multistriatus* Marsh.), the principal carrier of the disease in the heavily infected area, was not observed by the scouts. The native elm bark beetle (*Hylurgopinus rufipes* Eich.) and the snout beetles *Magdalis* spp. were reported over the entire area covered. Brisk autumn winds late in October almost completely defoliated the elms in New Jersey. During the latter part of October New Jersey scouts were engaged in locating and tagging dead and dying elms.

Garden club assists in fight on Dutch elm disease.--Effective cooperation in Dutch elm disease control has been extended by the garden club of Fairfield, Conn. Supporting a club resolution to actively participate in the fight on the disease, funds were made available for a survey of the community.

Virginia promulgates intrastate corn borer quarantine.--G. W. Koiner, commissioner of agriculture and immigration of Virginia, on October 4 approved a quarantine prohibiting the shipment of certain likely carriers of corn borer infestation from Accomac and Northampton Counties to other parts of the State. All public carriers, including railroads, boats, ferries, and trucks, have been urged to comply with the regulations. Since extensive State surveys have failed to locate the pest on the mainland of Virginia, the quarantine will be enforced to confine the infestation to the Eastern Shore.

Lime dust protects dahlias against insects.--During the dahlia-growing season, Long Island growers reported insect damage other than that caused by corn borers. This feeding sometimes stunted the plants. Various sprays and dusts were used. In one of the largest dahlia fields on the Island it was found that an inexpensive lime dust was as effective as any control method tried. Second-generation corn borer larvae were observed on Long Island by the middle of October.

FOREST INSECT INVESTIGATIONS

Parasite of oriental moth winterkilled in Massachusetts.--R. T. Webber, of the Melrose Highlands, Mass., field laboratory, reports that the severe winter of 1933-34 seriously interfered with the effectiveness of the introduced tachinid fly Chaetexorista javana B. B. which, since its importation from Japan in 1929 and 1930 and libertation in Boston and vicinity, has each year become increasingly important as a parasite of the oriental moth (Cnidocampa flavescens Walk.). During April 1934 a total of 652 cocoons of the oriental moth were collected from four localities. From these, 212 moths later issued but no adults of the tachinid were obtained. Dissections of the unissued cocoons showed that all C. javana maggots were dead. In contrast with these results, 74 C. javana adults issued from 153 cocoons collected from the same localities in November 1933. It is therefore evident that C. flavescens was not greatly affected by the cold winter, whereas the opposite is true for C. javana. It should be stated, however, that the cocoons collected in April were taken from situations where they had not been protected by snow or other covering, and it is hoped that maggots in cocoons so protected were not so seriously affected.

Two sprayings control European pine shoot moth.--C. E. Hood, Melrose Highlands, has examined pine buds from plots in Branford, Conn., that were sprayed in June for the control of the European pine shoot moth. In these experiments several different mixtures were tested. The examinations indicate that the best control was obtained in the plot sprayed with 4 pounds of lead arsenate and 4 pounds of bentonite to 100 gallons of water, with fish oil added as an adhesive, on June 15 and resprayed on June 28. In the samples examined 19.2 percent of the buds showed injury and 5.7 percent contained living larvae. Samples collected in the check plot showed that 69.5 percent of the buds were injured and that 36.6 percent contained living larvae. The plots will be examined again next spring when injury on the new growth is expected to be conspicuous.

Bark-beetle survey in Idaho.--J. C. Evenden, of the Coeur d'Alene, Idaho, field laboratory, reports that early in October he made an examination of the white pine stands of the Clearwater National Forest, where a rather severe infestation of the mountain pine beetle was recorded. A large percentage of the lodgepole pine of this forest has been destroyed by these beetles in an outbreak which during the past few years has spread northward from the Selway and Nezperce Forests. The white pine infestation undoubtedly originated from this same source. To obtain more detailed data relative to the white pine infestation, not only on the national forest lands but on adjacent private timber stands, an extensive survey of the infested areas was instituted on October 10. This survey, which will be completed early in November, will aid in determining the advisability of instituting control measures in the spring of 1935.

Tree medication reduces mountain pine beetle infestation.--W. D. Bedard, Coeur d'Alene, reports that an examination of the experimental medication area on the Kaniksu National Forest in eastern Washington showed a very satisfactory reduction in the mountain pine beetle infestation, notwithstanding the number of windfalls and other trees that were missed. Experimental control work was done in this area in the fall of 1933 by injecting the infested white pines with a solution of 4 ounces of sodium arsenate in 3 quarts of water. The medicated trees were felled and examined in June 1934, and at this time the high mortality in most of the trees indicated that there would be a substantial reduction in the infestation. This expectation was fulfilled, in that a survey of 10.5 percent of the area showed an infestation of 0.258 tree per acre, as compared with 0.395 tree per acre before treatment. Although the bark beetle broods were reduced by the injection, the braconid parasite Coeloides dendroctoni Cush. appeared to be unaffected by the poison and emerged in normal numbers from the medicated trees. This normal emergence of parasites, coupled with the reduction in infestation, was evident in the higher parasitization during the 1934 season.

Hemlock in Massachusetts defoliated by a spanworm.--H. J. MacAloney, of the New Haven, Conn., field laboratory, reports that he and J. V. Schaffner, Jr., of the Melrose Highlands, Mass., laboratory, have observed serious defoliation of hemlock by a hemlock looper on the Erving, Mass., State Forest and on adjacent private lands. The infestation covers about 50 acres, of which about 10 acres have suffered complete defoliation and some of the trees are dead. This spanworm was still in the pupal stage late in October and perhaps will not transform till spring. Slight defoliation by the common strain of Ellopia was also observed at the Harvard Forest, at Petersham, Mass., where the moths emerged in September as usual.

White pine weevil work complicated by a disease.--In some of the sample plots on reclamation of severely weeviled white pine stands in Massachusetts, a serious complication has arisen, reports Mr. MacAloney. On cuts larger than 2-1/2 inches a serious balsam rot, caused by the fungus Stereum sanguinolentum, is present. This fungus is a heart rot and will undoubtedly cause death wherever it has a chance to enter. Cuts, therefore, should be no larger than will be covered with the flow of pitch, or painting will have to be done. There is no evidence of the fungus on cuts on the smaller limbs. This also means that it is inadvisable to cut out one stem of a fork if the tree has attained a diameter of more than 2 inches at the point of forking.

GYPSY AND BROWN-TAIL MOTH CONTROL

Progress in gypsy moth work.--During October it was necessary to continue the patrolling of barbed-wire fences erected around sprayed areas at a number of locations, because the owners continued to use adjoining property for pasturage. In some sprayed areas the owners have moved livestock to other pastures and this permitted the taking down of considerable wire which was returned to the storehouse. Scouting work was continued in certain towns in Vermont, Massachusetts, Connecticut, and Pennsylvania. In the last-named State there was considerable general woodland scouting, also some around the sites of assembling cages that have attracted male moths during last summer. Some scouting was also performed along river banks and in lowlands so as to complete this work before high water should carry infested materials to uninfested sections.

Thousands of gypsy moth egg clusters treated by conservation-corps workers.--At the V. C. C. and C. C. C. camps the men engaged in gypsy moth work have been devoting a good deal of their time to old infestations that were discovered last year. Particularly careful work is being done at such infestations and many thousand gypsy moth egg clusters have been destroyed. A considerable amount of work done this fall has been performed in areas where the trees were burlapped last summer and where many gypsy moth caterpillars and pupae were killed.

PLANT DISEASE CONTROL

Quarantine 38 effective in barberry eradication.--One phase of the barberry-eradication program which will have a definite bearing on the ultimate success of the stem rust control program is the effective application of Quarantine No. 38 (revised), which prohibits the interstate shipment of *Berberis* plants susceptible to stem rust into or between the 13 North Central States participating in the eradication program.

Barberry susceptibility tests.--There are in the United States some 200 species, varieties, and hybrids of *Berberis*. Some 30 or 40 of these are grown extensively in nurseries. Many are propagated under trade names and their true identification may be unknown. At frequent intervals new varieties are introduced or new hybrids developed. To assist in the identification and classification of existing plants and to determine their reaction to the stem rust fungus, barberry plots have been established at the Foreign Plant Introduction Garden at Bell, Md. Approximately 100 species and hybrids of barberry have been collected and planted. In addition, seed has been collected from bushes growing in nurseries throughout the United States and planted for future observations. These will be tested to determine whether first-generation and second-generation seedlings will react to the fungus in the same manner as does the parent stock. During the month of September the first outdoor susceptibility test was conducted at Bell. An unusual amount of moisture had produced succulent growth and other weather conditions were favorable for the test. Excellent results were obtained. Similar tests will be conducted in the spring and fall of next year.

Over 4,000 acres of nursery stock inspected for stem rust.--During the past summer 21 nurseries, comprising 4,478 acres of nursery stock, were inspected. All species of barberry susceptible to stem rust were destroyed or otherwise disposed of and many questionable varieties were identified. The species and varieties for which the rust reaction had not been determined were collected for testing purposes. Nurseries free of barberries susceptible to stem rust are given permits allowing interstate shipment of barberry that is immune or highly resistant to the stem rust fungus.

Many varieties of barberry carry rust.--More than 100 varieties of barberry are known to be susceptible in varying degrees to the stem rust fungus. Between 30 and 40 varieties have been determined to be immune or sufficiently resistant to permit propagation within the barberry-eradication area without creating a rust hazard. Future tests of questionable varieties will be conducted under controlled conditions in both field and greenhouse.

Ribes eradication in 1934--summary.--*Ribes*-eradication work for the protection of valuable white pine stands was brought to a close for the season during September in most of the areas where this work was in progress. During the active season, extending from early in May through September, very satisfactory progress was made on this project. The following table shows the results of the season's work by pine regions:

Region	Total area worked	Total labor	Total Ribes eradicated	Ribes eradicate per acre	
	Acres	Man-days	Number	Number	Man-days
Northeastern States---	756,942	207,045	22,450,142	30	0.27
North Central and Lake States--------	395,785	132,288	38,571,365	97	0.33
Southern Appalachian States-------------	867,459	67,515	2,069,995	2	0.08
Western States--------	880,094	545,488	132,642,707	151	0.62
All----------------	2,900,280	952,336	195,734,209	67	0.33

The remainder of the work season will be devoted to pre-eradication surveys in preparation for next season's work.

Blister rust control in the southern Appalachian States.--In general the work of Ribes eradication in the southern Appalachian district for the season of 1934 was finished by October 15. However, owing to the lack of freezing weather, eradication of cultivated Ribes near valuable pine areas was being carried on in North Carolina, South Carolina, and Georgia throughout the month. In Virginia, eradication work was carfied on through October. Excellent progress was made in the control work during the past season, but there still remains in each State a considerable area in which no mapping of pine or Ribes eradication has been carried on. During the month of October the blister rust was discovered for the first time on Ribes in Nelson County, Va., within the boundary of the Natural Bridge division of the George Washington National Forest. This represents a further southern extension of the disease in the Appalachian region of about 25 miles. The foresters in the Shenandoah National Park are planning on removing diseased branches from white pines along Skyline Drive.

New blister rust infection centers found.--Blister rust infection on white pines has recently been reported for the first time in several new counties. Diseased white pines were found for the first time in Ohio, near Chagrin Falls in Geauga County. The rust was also found for the first time in Iowa on native white pine and wild Ribes in Dubuque County. In Maryland, Allegany County has been added to the list of counties having infected white pines. In lower Michigan, infections on native white pines have been reported for the first time in Leelanau, Emmet, Otsego, Alcona, and Sanilac Counties. Most of the cankers are of recent origin, indicating that the disease is just becoming established on the pine.

COTTON INSECT INVESTIGATIONS

Effect of defoliation on boll weevil movement.--The effect of defoliation of cotton by leafworms on the field movement of boll weevils was shown by the weevils caught on flight screens, as reported by G. L. Smith, J. C. Clark, and A. L. Scales, of Tallulah, La. Most of the weevils caught during October were taken at one reading following the defoliation of the fields by the leaf worms, and over half of the total number of weevils were taken from two fields that were completely defoliated in a very few days. The average number of weevils per screen, taken in the different classes of fields, was as follows: On 4 screens in fields not defoliated, 29; on 3 screens in fields partially defoliated by October 25, 58; on 5 screens in fields totally defoliated by October 25, 147.

Boll weevil parasites in cotton collections from 11 States.--During the past season collections of infested cotton squares were made in all of the States where the boll weevil occurs, except Virginia. The infested material was placed in cages at Tallulah, La., and from the 214,538 cotton squares, 92,662 boll weevils and 3,913 parasites emerged. Altogether 528 collections were made in 118 counties of the 11 States. Although the percentage of parasitization based on squares producing either weevils or parasites, was only 4.05, and the percentage of parasitization, based on the total number of squares caged, was only 1.82, there were striking variations in the percentage of parasitization from different States and from different fields. Some collections of squares producted no parasites, while one contained 82 percent. More fields with a high percentage of parasitization were found in Georgia than in any other State. The percentage of parasites from collections in certain fields in the other States went as high as 43 in North Carolina, 38 in Alabama, 37 in Mississippi, 33 in Oklahoma, 26 in Texas, 22 in South Carolina, 4 in Arkansas and Louisiana, 2 in Tennessee, and 1 in Florida. Over 70 percent of all parasites reared were Microbracon mellitor Say.

Pilosity of cotton plants.--Among the characters of the cotton plant that are being studied by E. W. Dunnam, Stoneville, Miss., in his search for boll weevil-resisting characters, is pilosity of the leaves and stems. Representative cotton-plant samples, aggregating 250, were collected from each variety growing at each station for pilosity studies, which are now being made. This work shows that there is a considerable variation in the distribution of the hairs on the various parts of individual plants, as well as on similar parts of the individual plants. Of 80 varieties studied, pure Sea Island was the only variety entirely devoid of hairs on all parts of the plant, except on the lower epidermis of the leaves. Egyptian Pima was the only other variety that had no hairs on leaf petioles. No varieties studied had hairs on the inner epidermis of bracts, with the exception of Missdel No. 4, Rowden No. 5031, and D. and P. L. Station. The only variety having more hairs on the upper than on the lower surface of leaves was D. and P. L. No. 10.

Boll weevils in wild cotton.--In order to definitely answer the question as to whether or not the boll weevil of the Eastern States will develop in Thurberia thespesioides, the so-called wild cotton of Arizona, plants were grown this season at several places. F. F. Bondy, Florence, S. C., and R. C. Gaines, Tallulah, La., have now reported that boll weevils fed on, oviposited in, and developed normally to the adult stage in the buds of the Thurberia plant growing in the open under field conditions adjacent to cotton.

Flea hopper abundance.--Collections on flight screens and by sweeping, reported by K. P. Ewing and R. L. McGarr, Port Lavaca, Tex., show an abundance of cotton flea hoppers this fall. About five times as many hoppers were taken on the screens this October as last year, most of them being caught during the first 2 weeks of the month. There was a heavy flea hopper infestation in cotton in the Port Lavaca section this summer and the late summer rains have produced an abundant growth of croton plants. With the large numbers of hoppers present in October and plenty of host plants for egg laying, conditions appear very

LIBRARY
STATE PLANT BOARD

favorable for a large carry-over.

Heteroptera damage cotton in Arizona.--T. P. Cassidy and T. C. Barber, of Tucson, Ariz., have shown by their cage experiments this summer that several heteropterous insects are responsible for the staining of cotton lint, which is such a serious problem in Arizona. The most important insects known to cause staining in Arizona are *Euschistus impictiventris* Stal. and *Chlorochroa sayi* Stal. In a recent survey covering the five cotton-growing counties of the State, 23.3 percent of the bolls were found to be punctured by insects of this group.

PINK BOLLWORM AND THURBERIA WEEVIL CONTROL

Pink bollworm findings.--The most important development, as a result of gin-trash inspection during October, was the finding of reinfestation in Midland and Martin Counties, Tex. The first specimen, a living larva, was found in Midland County on October 18, and two other living specimens were found the following week. The last previous finding in this county was in the 1931 crop. Some cotton from Ector and Andrews Counties is also ginned at Midland and, as a result, all three counties are involved in the findings. On October 24 a specimen which had apparently been dead only a short time was found in Martin County. All inspections in these counties have since been negative.

Gin-trash inspection closing down.--Gin-trash inspection has been completed in Alabama, Florida, and Georgia, no important findings having been made since the last News Letter was issued. Inspections are going forward in the Salt River Valley of Arizona and in the Thurberia weevil area in Pima County, Ariz., all results having been negative to date. Specimens have been found in some of the older regulated areas; namely, the Safford Valley of Arizona, the Pecos Valley of Texas, and the Mesilla Valley of New Mexico. In most of these areas gin-trash inspection as a general practice has been discontinued. Instead, green bolls have been collected and will be inspected a little later in the season. This should give a more accurate indication of the degree of infestation.

Clean-up for pink bollworm will soon begin.--For the last two seasons a field clean-up has been carried on in the Big Bend area of Texas for the purpose of reducing the heavy infestation and thereby eliminating the danger of spread to other areas. The practice will again be followed this season, and clean-up work was begun the latter part of the month. Farmers are rushing the picking of their remaining cotton as much as possible so as to get the fields ready. It is expected that with favorable weather the work will be completed much earlier this year. As an example of the cooperation we are receiving, a farmer was recently offered approximately $400 for the right to pasture cattle on his farm. Being strongly in favor of the clean-up, he refused the offer.

Pink bollworm found at Marfa, Tex.--The first finding of pink bollworm specimens in material confiscated at the Marfa, Tex., road station this season was made on October 17, on which date 1 dead larva was found in seed cotton taken from a truck. On October 24, 1 dead and 6 living larvae were found in seed cotton taken from another truck. On October 31, 1 dead and 5 living larvae were found in two cotton bolls that were being taken to Michigan as souvenirs.

TRUCK CROP AND GARDEN INSECT INVESTIGATIONS

Conference on beet leafhopper.--During the period from October 18 to 21 a conference of the workers on the beet leafhopper was held at Modesto, Calif. In addition to representatives of the Bureau's field laboratories at Modesto, Twin Falls, Idaho, Salt Lake City, Utah, and Grand Junction, Colo., the conference was attended by Eubanks Carsner and N. J. Giddings, of the Bureau of Plant Industry, H. H. P. Severin, J. H. Freitag, and C. G. Weigle, of the University of California, and W. H. White, of this Bureau.

Pea weevil causes losses in cannery peas.--A. O. Larson, of the Corvallis, Oreg., field laboratory, reports that field examinations in the pea-growing districts of that State have revealed a very heavy loss in the harvest of cannery peas owing to the pea weevil. In some of the fields examined, practically all the pods contained peas infested by the weevil. Special observations conducted in certain of these fields indicated a rate of loss of more than 2 tons of green pods per acre.

Derris effective against Mexican bean beetle.--L. W. Brannon, of the Norfolks, Va., field laboratory, reports that derris dust containing 0.75 percent rotenone, or derris root powder used as a spray containing 0.03 percent rotenone (2.5 pounds of derris root powder containing 5 percent rotenone per 50 gallons of water), were very effective in controlling the Mexican bean beetle on snap beans at Onley on the Eastern Shore of Virginia. Of the various diluents used as a carrier for derris, it appeared that talc had the best dusting qualities and was cheaper than ground marc or tobacco dust. When influsorial earth was used as a carrier, poor foliage protection resulted, and the increase in yield of beans was less than half that obtained from plants tested with the derris-talc dust mixture. A commercial derris-dust mixture, containing 0.55 percent rotenone, increased the yield only about one-half over that obtained from the derris-talc mixture containing 0.75 percent rotenone. In this series of tests the derris root powder used as a spray resulted in better increases in yield of the treated plants than any of the other spray materials. Similar tests at Norfolk, Va., demonstrated that 2.5 pounds of the derris root powder (5 percent rotenone) per 50 gallons of water, gave bette foliage protection from the bean beetle than when the material was used at the rate of 1.5-50 strength, or with bentonite sulphur, powdered white soap, or miscible pine oil.

Timing of treatments improves bean beetle control.--L. W. Brannon, Norfolk, reports that in a series of experiments on snap beans at Onley, the best foliage protection from the Mexican bean beetle was obtained from four insecticide applications at approximately weekly intervals. Also, the results of these tests indicated that of these four treatments, the first and fourth (applied when the plants were beginning to develop the first trifoliate leaves and again when in full bloom) were the most important in controlling the bean beetle, under the conditions existing on the Eastern Shore of Virginia.

Fluorine compounds most effective against tomato pinworm.--R. E. Campbell and J. C. Elmore, of the Alhambra, Calif., field laboratory, report that in preliminary tests against the tomato pinworm (Gnorimoschema lycopersicella

Busck), which has been causing severe damage to tomatoes in southern California during 1934, the fluorine compounds were most effective in reducing the number of larvae per plant. The materials tested also included derris, nicotine, pyrethrum, and paris green.

Wettable sulphur sprays give best control of redberry mite in Washington.--S. E. Crumb, of the Puyallup, Wash., field laboratory, reports that during 1933-34, the wettable sulphur spray (5-100) gave generally superior results to lime sulphur (1-40) or other insecticides tested in the control of Eriophyes essigi Hassan on blackberry. A dormant (spring) application of lime sulphur (8-100) proved superior to a fall application in controlling the mite and also increased the yield of berries. When three or more spray applications were made a lower yield resulted than when but two sprays were used.

Effectiveness of calcium cyanide against potato tuber moth.--H. H. Richardson, of the greenhouse-insects laboratory, Washington, D. C., conducted some tests in a standard fumigation box to determine the effect of calcium cyanide fumigation on the moths of the potato tuber worm as a possible indication of this method of control for a closely related species, the tomato pin worm, which is becoming quite a pest in some of the greenhouses in Pennsylvania and Delaware. The results indicate that a dosage of 1/8 ounce per 1,000 cubic feet of space has no effect on the moths. This dosage, under fumigation-box conditions with its 17-hour exposure, is easily equal to 3/16 or 1/4 ounce dosage in an overnight fumigation in a fairly tight greenhouse. As 1/8 ounce is the highest dosage that can be used with safety in fumigating tomatoes, little likelihood appears that this fumigant would be effective on the growing crop under practical greenhouse conditions.

Fumigation of mushroom houses at peak heat.--A. C. Davis, of the Takoma Park, Md., laboratory, continuing his studies on the fumigation of mushroom houses, reports that hydrocyanic acid gas, generated from either sodium cyanide or liquid hydrocyanic acid, gave a much higher concentration than did calcium cyanide when equivalent dosages of all three were used. Calcium cyanide in granular form gave a peak concentration that averaged 0.89 mg per liter, and dropped below 0.4 mg per liter in 55 minutes. From 10 to 15 minutes was required to reach peak concentration. Calcium cyanide dust gave a slightly higher concentration, over a longer time, but was still too low to be effective at the temperatures found at floor level in mushroom houses. The dust is more dangerous to use in the ordinary manner than is the granular form. Gas from sodium cyanide and acid and from liquid hydrocyanic acid forced into the house through a pipeline gave peak concentrations of nearly 3 mg per liter in from 3 to 5 minutes, requiring from 55 to 62 minutes to drop below 0.4 mg per liter, the average. The cost per fumigation with sodium cyanide and acid is less than half that with either calcium cyanide or liquid hydrocyanic acid. Tests run in the fumigation chamber indicate that the concentrations obtained in the mushroom houses should be nearly 100 percent lethal.

Heavy rains reduce tobacco fleabeetle population.--F. S. Chamberlin, of the Quincy, Fla., laboratory, reports that heavy rains are quite detrimental to adults of the tobacco fleabeetle, the reduction ranging from approximately 90 to 95 percent, as compared with the numbers on plants that were protected from the rain, by a special cage device.

INSECTS AFFECTING MAN AND ANIMALS

Screw worm infests Gulf coast from Florida to Texas.--A recent survey by E. W. Laake in the counties of Liberty, Jefferson, and Orange in southeastern Texas, shows that the present screw worm infestation is continuous along the coastal region of the Gulf States into Texas. The following is quoted from Dr. Laake's report: "Many interesting factors have been observed in this survey in various counties, especially with reference to what might be accomplished where calving and certain operations are not practiced during the screw worm season. A good example of this is seen in Orange County and Calcasieu and Cameron Parishes. One ranch at Orange, Tex., has 2,500 cattle in Calcasieu Parish, La., 1,000 in Cameron Parish, La., and 2,000 in Orange County, Tex. As the grazing area in Calcasieu and Cameron Parishes is all open and ranchers have no control over the breeding season, there is a screw worm infestation in cattle amounting to over 10 percent in the 3,500 animals located in those two parishes, whereas the infestation did not exceed 5 percent in the 2,000 animals in Orange County, where the ranches are fenced and where summer calves are not permitted to drop. As these two parishes are separated from Orange County only by the river, certainly no other factors except those indicated above could be responsible for the much heavier infestation in the herds in the Louisiana territory." In Georgia, Florida, and Mississippi the educational campaign for screw worm control has been continued in cooperation with the F. E. R. A. and interested State agencies.

Screw worms in Iowa.--A sporadic infestation of screw worms in Plymouth and other counties in northwestern Iowa was reported during the month. A survey of the infested territory was made by E. F. Knipling, of the Ames, Iowa, laboratory.

Liberation of the blowfly parasite (Alysia ridibunda Say).--A. W. Lindquist reports: "A total of 9,220 A. ridibunda have been released at 161 locations up to a distance of 25 miles in all directions from Uvalde, Tex. The number of parasites released at each point has ranged from 25 to 300, and with an average of about 60. More females than males have been liberated. The colonizations have been scattered so as to cover as great an area as possible, rather than concentrate hundreds at one locality, because the establishment of the parasite apparently depends upon whether the female finds a carcass of suitable age and development within a short time after release. By covering a comparatively large area, it is hoped that carrion would be available for the parasites near at least a few of the colonizations. No provision has been made for distributing infested carrion. However, releases have been made at dove-hunting grounds, where it is highly probable that hunters have lost dead and wounded birds. Also, sites have been chosen where much small animal life was believed to exist and, in a few instances, liberations have been made near carcasses. We have not been able to get the parasite through on *Cochliomyia macellaria* Fab. in the laboratory, and it appears that the building up of the species must be in small carcasses containing a high percentage of *Sarcophaga* and *Lucilia* larvae. *Alysia* has been observed on carrion after releases, has been recovered in the regular Kennedy status jars, and in one case a second generation of a small release made on September 6 has apparently been recovered. A liberation of 300 *Alysia* made on October 2 at a brush pile was observed on the following 4 days. Most of the males stayed at the brush and ever so often made short upward, circular flights and returned to the brush. Very probably the males remain close to the emergence site and copulation occurs close by."

Bot flies survive low temperature.--R. W. Wells reports that the minimum temperature for the season at Ames, Iowa, 19° F., was recorded on the nights of October 28 and November 1. Both *Gastrophilus nasalis* L. and *G. intestinalis* DeG. were active on November 7.

A city bureau of insect control.--The City Council of Portland, Oreg., has set up a Bureau of Insect Control. H. H. Stage acted in an advisory capacity with the committee that drafted the ordinance creating it. It is believed that the ordinance creating this bureau is somewhat unique in city legislation. Section 1 reads as follows: "There is hereby created the Bureau of Insect Control. Said bureau shall have control over all nuisances created by earwigs, elm leaf beetle, mosquitoes, and all other injurious insects affecting premises, buildings, trees, or shrubs within the corporate limits of the city; and earwigs, elm tree beetles, mosquitoes, and other insects are hereby declared to be a nuisance. The Bureau of Insect Control shall be administered by and under the supervision of a city insectarian, which position of city insectarian is hereby created. The duties of said city insectarian shall be to supervise the eradication of earwigs, elm leaf beetles, mosquitoes, and other injurious insects affecting premises, buildings, trees, or shrubs within the city; and to that end said city insectarian or his assistants or employees in the Bureau of Insect Control shall have power and authority to enter into and upon any premises in the city for the purpose of inspecting the same to determine the presence of earwigs, elm leaf beetles, mosquitoes, and all other injurious insects, whether same are on the premises or in the buildings, trees, or shrubs, and if it shall be determined from such inspection that any such nuisances exist on any such premises in any buildings, on any trees or shrubs, or in any other places within the city, such city insectarian shall, either directly or through his assistants or employees in the Bureau of Insect Control, take immediate action to abate the same in such manner as may be deemed proper to accomplish such purpose. The same city insectarian shall have power and authority to confer with and receive gratuitous service and advice from persons trained in such work, or such entomologists of Oregon State College or any bureau of the United States Government or employee of the United States Government engaged in such work. Said Bureau of Insect Control shall have power and authority to use such means, methods, materials, liquids, or poisons, as shall be determined necessary to carry out the eradication of the said nuisances, or to use any other scientific means of eradication or control of such nuisances." Other sections of the ordinance make it unlawful for any person to interfere with the insectarian or his assistants and provide penalties for violations of any provisions of the ordinance.

Demonstration of autogiro in mosquito control.--A demonstration of the use of the autogiro in spraying oil on mosquito breeding places was recently given on Long Island by a commercial autogiro service company before entomologists and others interested in mosquito control, the witnesses including J. L. Webb, who represented this Bureau, and representatives from the States of New York and New Jersey and the New York City Department of Health. Admittedly, the development of the use of the autogiro for this purpose is still in the experimental stage. It was clearly shown, however, that there are distinct possibilities for the development of an efficient and rapid method of laying down an oil film on mosquito breeding places. Such a service would be especially desirable on undrained marsh areas immediately after heavy rains, when mosquitoes breed prolifically and present methods of oiling are time consuming. The consensus of opinion among those witnessing the demonstration was that the autogiro has certain advantages over the airplane for such service.

FOREIGN PARASITE INTRODUCTION

More pink bollworm parasites from Egypt.--The third and final shipment of Microbracon kirkpatricki Wilk. was received from H. L. Parker early in November. This comprised approximately 1,500 individuals in the immature stages. The material was in perfect condition and extensive emergence was taking place at the time of arrival. Several thousand adults have emerged from these three shipments at the pink bollworm laboratory at Presidio, Tex., and are being used as a rearing stock for large-scale production and liberation next season.

Japanese beetle parasites from Japan.--L. B. Parker and M. H. Brunson, Moorestown, N. J., report that on October 19 a consignment of 944 field-collected females of Tiphia popilliavora Roh. was received from Yokohama, Japan. These wasps were all collected at Yokohama, where previously the species had been practically unknown. In one locality, a small, filled-in area along the water front, only the Asiatic beetle (Anomala orientalis Waterh.) was being attacked, whereas only 2 or 3 miles away in another collecting area the attack was very largely restricted to the Japanese beetle. The consignment was packed in the usual type of cans used for shipment of adults and arrived in excellent condition, 86.3 percent of the females being alive and vigorous.

FOREIGN PLANT QUARANTINES

Recent entomological interceptions of interest.--Six living larvae of Ceratitis capitata Wied. were taken last July at Boston in three apricots in stores from Spain. This is the first record in our files of this fruit fly being intercepted in apricots. The Mediterranean fruit fly was also found at San Pedro, Calif., in star-apples (Chrysophyllum cainito) in ship's quarters from Hawaii. An adult of Platypus dimidiatus Chapu. was intercepted last August at New York in balsa (Ochroma lagopus) in cargo from Ecuador. Living specimens of Mertila malayensis Dist. were found last July at Honolulu, T. H., on orchids (Aerides lawrenceae and Trichoglottis brachiata) in baggage from Manila, P. I. A living specimen of Myrmecophila quadrispina Perkins was taken at Seattle, Wash., in soil around plants in baggage from China. A living adult of Aeolus facetus Cand. was intercepted at Mobile, Ala., with banana debris in cargo from Honduras. Living adults of Ernoporides jalappae Letz. were taken at New Orleans in four-o'clock (Mirabilis jalapa) roots in cargo from Mexico. The West Indian sweetpotato weevil (Euscepes batatae Waterh.) arrived last August at Washington, D. C., in a sweetpotato in the mail from British Guiana. A living specimen of Scolopostethus decoratus Hahn was found at Baltimore on dried heather in the mail from Scotland. A specimen of the European corn borer (Pyrausta nubilalis Hbn.) was intercepted at Philadelphia in broomcorn in the mail from Hungary. Kolla fasciata (Walk.) arrived at San Francisco with banana debris in cargo from Panama. Living larvae of Corymbites cinctus Payk., Dinoderus minutus Fab., and Nicobium castaneum Oliv., were intercepted last July at New York in the bark of pear-tree logs in cargo from France. Living adults of Arthrocorynus dotatus Champ. were found last July at New Orleans in hardwood logs in cargo from Mexico. A living adult of Pityogenes chalcographus L. was taken at Baltimore in the bark of fir boards used as dunnage in the hold of a ship from Sweden. A small amount of bark was adhering to the boards.

Recent pathological interceptions of interest.--Phoenicostroma chamaedoreae Syd. was intercepted at El Paso on August 24, the host being palm leaves from Mexico. This fungus was not represented in the Bureau of Plant Industry herbarium, but the intercepted material fits the description and illustration published by Sydow. Hendersonia n. sp. was collected on a cactus (Opuntia? sp.) from Mexico at the Washington inspection house on September 7. Phymatotrichum sp. was intercepted at Philadelphia on September 19 in cabbage leaves from Spain. Apparently no species of this fungus has been reported as attacking Brassica. Diseased taro roots from China were intercepted at New York on September 5 and were found to be infected with a phycomycete, possibly Phytophthora colocasiae Rac. Puccinia urbaniana, P. Henn. was intercepted on September 18 at New York on Valerianodes sp. from Puerto Rico. The only previous interception was made on a different host in Puerto Rico when the material was offered for inspection for export. A lemon cutting from Italy intercepted at New York on August 22 was found to be infected with Phoma sp. The spores of the fungus were very minute, only doubtful species described for this genus having such spores. Our first interception of Septoria nigerrima Fckl. was made at New York on August 2 on pear leaves in baggage from Italy. According to Stevenson's manual this disease has been found in New York.

Baseballs found to have cotton cores.--Three shipments of baseballs made in Japan and designed to be sold here at a low price largely for the sandlot type of our national sport, were held up by the plant quarantine inspector in New York in October because their cores, or bodies, consisted of tightly compressed cottonseed hulls, which are forbidden entry to this country on account of the danger of such material carrying the well-known pink bollworm.

Cotton samples pose as packing.--Recently the appraiser at Galveston, Tex., reported a trunk and a box from Germany listed as personal effects. Packed between the articles were sizable rolls of raw cotton. The box contained mostly photographic supplies, and rolls of cotton were packed between the various articles, giving the impression that cotton was the cheapest and most readily available packing material found in Germany. This impression would probably have registered, had not the address of the owner been Cotton Exchange Building, Houston, Tex. From this baggage approximately 5 pounds of cotton samples of a good grade were collected and destroyed.

Bureau hopes to save rare orchids.--A shipment of some 25 orchids from Borneo, representing a rediscovery of a rare variety long believed lost to science, was found on inspection to be infested with 14 different types of pests, among which was an unknown weevil of apparently quite destructive character. Because of the rare nature of the collection every effort is now being made to free the shipment from this parasite without destroying the plants. Salvage treatment in this case is made difficult because an entirely new insect of unknown life habits is involved, as well as by the fact that the weevil is of the stem-boring type, hard to reach by ordinary treatment. It now appears from observation of these plants in quarantine quarters that at least a part of the shipment can be saved and turned over to the importer, freed from the parasite. It is quite within the realm of possibility that so destructive an insect might well have been the cause of an almost complete extermination of this orchid in its native haunts, thus accounting for its lengthy disappearance from botanical knowledge.

Stray leaves carry fungi.--In September a shipment of cycads arrived at the Washington inspection house from Australia. In the bushy crowns of these plants were wedged almost a peck of leaves of other plants, mostly eucalyptus, lodged there doubtless in the course of their fall from nearby trees. These stray passengers on examination showed two species of Phyllosticta, a species of Melasmia, and one of Sphaeropsis. In fact, this incidental debris carried more fungi, both in number and importance, than did the cycads themselves. This case presents an outstanding example of a channel of entry for pests which anyone unfamiliar with the inspection problem would be inclined to estimate as trivial; yet it is a channel for which the inspection staff must be constantly on the watch.

DOMESTIC PLANT QUARANTINES

Transit inspection.--During the fall shipping season for nursery stock, the checking of shipments at railway terminals has been increased through the assistance of inspectors on projects relating to the white pine blister rust and the European corn borer, and by State inspectors of Iowa, Illinois, Minnesota, New York, and Florida. Seasonal work closed at Kansas City on November 9 and at Omaha on November 15. It will be continued for a somewhat later period at Saint Paul, Detroit, Spokane, Portland, and Seattle. At the two latter points the shipping season normally continues well into December. Year-round inspection is carried on at Boston, New York, Philadelphia, Washington, Jacksonville, Fla., and Chicago. At Cleveland and Indianapolis arrangements are being made to resume the checking of shipments about November 20. A marked drop in violations of the white pine blister rust quarantine is noted, only one nurseryman having been reported thus far as failing to comply with requirements. A summary of the work of transit inspection at New York City during the fiscal year 1934, recently received from the inspector in charge, reports that 484 violations were found at that station, out of 158,133 shipments inspected. The violations were moving to 40 different States, the District of Columbia, and Canada. They related to the gypsy moth, the Japanese beetle, the satin moth, narcissus bulb pests, and white pine blister rust. General nursery stock made up the contents in about 40 percent of the violations, with rosebushes and miscellaneous cut flowers ranking next.

Citrus canker.--October inspections in three counties in Texas resulted in finding citrus canker infections of a very light and recurrent nature on one tree in Galveston County and one in Brazoria County. Sporadic infections had previously occurred on both premises. The infected tree in each instance was a Louisiana sweet round orange growing among satsumas. The trees were accordingly cut or trimmed and sprayed, and all defoliated leaves swept up and burned. Surrounding satsummas were also sprayed. The owners have agreed to allow destruction of the infected trees if infection is evident on the next inspection. The agent reports that while complete eradication of citrus canker from these two premises seems somewhat slow, he believes the continued efforts are showing good results in that the disease is being held very closely in check. The month's inspections covered 187,364 trees. In Louisiana inspections were made in 11 parishes but no citrus canker infections were found. The work covered 9,113 trees in groves and 18,000 in nurseries.

Phony peach disease.--Several commercial orchards in Spartanburg and Greenville Counties, S. C., were scouted in October at the request of State officials to determine whether the phony peach disease was increasing in that area. No infections were found, although infected trees had been noted in home orchards at Greer, in Greenville County, in the course of nursery inspection. In Georgia, commercial orchards were inspected in 16 counties. Certain varieties of peach were defoliated however and could not be inspected. Inspectors found it difficult in some counties to furnish service to everyone who requested it. There were 1,361,150 trees inspected, of which 14,343, or slightly more than 1 percent, were found to be infected, and these were destroyed. Nursery premises were inspected for the phony peach disease and peach root borer by State and Federal inspectors during the month around 6 nurseries in Arkansas, 24 in Tennessee, and 10 in Texas, and on 111 properties in Georgia. Owing to the strong demand for peach nursery stock, it appears that practically all salable peach stock grown in the Southern States this year may be dug and shipped during the fall.

Peach mosaic disease in Colorado.--The peach mosaic situation in western Colorado is covered in a recent report from the State Entomologist, in which he states that inspection has recently been made of all peach orchards, or approximately 350,000 trees, in the Palisade section of Mesa County, where some 6,500 infected trees were located. Of these, about 50 percent have been eradicated and it is expected that many others will be taken out. Two relief workers assisted a State inspector in the scouting and also assisted the growers in taking out the diseased trees. Inspection had not been made of some orchards in Mesa County and none in Delta County. Only one small nursery supplying annually a few hundred trees to local buyers is in the infected area. Budding wood, however, has been supplied by growers to nurserymen in the East and South, and the State Entomologist is now obtaining information as to points where such shipments have been made in recent years. The outbreak of peach mosaic in Colorado is recognized as a serious menace to the important peach-producing region along the Colorado River east of Grand Junction. It is known to occur only in Colorado and Texas.

CONTROL INVESTIGATIONS

Sterilization of Spanish grapes under way.--The first lot of Spanish grapes sterilized for the Mediterranean fruit fly was removed from storage on October 25. The grapes were placed on sale in Boston and sold at prices ranging from \$2.70 to \$7 per keg, each keg containing 46 pounds, the average price for the lot of 522 kegs being \$4.85, or a little more than 10 cents per pound. From the results obtained in sterilizing the first lot, there is no question but that the treatment can be applied to Spanish grapes if the grapes are in good condition when placed in storage. The treatment requires that the grapes be cooled to a temperature of 30° to 31° F. at the center of the keg and held at that temperature for a period of 15 days. The first shipments of grapes amounted to 13,900 kegs and the second shipment was approximately 40,000 kegs. The third shipment, which is on its way from Spain, will also be approximately 40,000 kegs.

BEE CULTURE

American foulbrood recurs in treated combs after 5 years.--When combs infested with American foulbrood are disinfected with formaldehyde and returned to the bees, disease frequently recurs after brood reared in the combs has remained healthy for one or more seasons. It is commonly believed that there is little or no danger of recurrence beyond the second brood-rearing season. Jas. I. Hambleton reports that in 1929 at the Somerset, Md., laboratory, 9 colonies were placed on American foulbrood combs after the combs had been treated for different periods of time with formaldehyde gas. Disease developed in 3 of these colonies during the first season, in 1 the second season, in 1 the third season, in none the fourth season, and in 1 the fifth season. In cultural tests on the combs, slight growth after prolonged incubation was obtained from some of the combs in which disease developed during the first season, but no growth was obtained in cultures from the other sets of combs. Other colonies in the apiary which did not have treated combs remained healthy and no source of infection other than the treated combs could be discovered. Consequently, there seems to be little doubt but that in each instance the development of American foulbrood in the gas-treated combs was a recurrence. These results emphasize the danger connected with the use of treated combs, as well as the necessity for continuing regular inspection for 5 years or longer, when treated combs are used. They also indicate that disease may occasionally recur in combs, even when no growth is obtained in cultural tests.

Relation of pollen reserve to spring population of colony.--C. L. Farrar, Laramie, Wyo., reports that commercial beekeepers have manifested keen interest in the results obtained during the past 2 years at Laramie, in a study of the close relationship between the spring populations of overwintered colonies and the amount of reserve pollen left with the colonies in the fall or given to them during the late winter months. It has been found that in rearing brood good colonies will utilize 300 square inches of pollen in less than 3 weeks. In 1932-33 some colonies consumed more than 600 square inches of pollen from 5 to 6 weeks before new pollen became available. In 1933-34 equivalent colonies provided with 600 square inches had consumed this entire quantity by the time new pollen became available; however, last season was about 5 weeks earlier than those of former years and 3 weeks earlier than normal. In a survey conducted the last of September, using 1,500 and 1,100 colonies, respectively, in apiaries of two large beekeepers in northern Colorado, where it might be expected that more than average pollen reserves would be found, an examination of 226 colonies in 6 widely scattered yards gave the following results: In 3 yards at Greeley and vicinity, the pollen reserves per colony averaged 89, 118, and 171 square inches, respectively, whereas in 3 yards at Brush and vicinity, the average was 168, 240, and 334 square inches, respectively. Even though these localities have pollen available several weeks earlier in the spring than is the case at Laramie, these reserves are probably too low for maximum development of the colonies in late winter and spring. Furthermore, the variation in reserves between colonies in each yard was very great. The condition of these colonies will be checked next spring. During the dandelion flow at Laramie, Wyo., last spring, the experimental colonies having maximum reserves of pollen practically replaced the honey stores consumed in the winter period, whereas those wintered without pollen consumed over 50 pounds of honey and only maintained their weight during this flow.

Nectar surplus from goldenrod in Louisiana.--For the past 6 years goldenroad (Solidago altissima) has yielded a surplus of nectar in October at Baton Rouge, reports E. Oertel, of that laboratory. This surplus will be of considerable value to beekeepers, as it will aid in supplying additional honey for winter and early spring. In previous years the honey flow from goldenrod was apparently brought to a close by rainfall and a sudden drop in temperature, but in 1934 the flow ceased rather suddenly without any noticeable change in the weather. Although the maximum number of plants had stopped blossoming, apparently a large number of goldenrod blossoms were still available to the bees. Similar conditions existed at Donaldsonville, about 45 miles from Baton Rouge, where a scale colony also ceased to gain in weight at about the same time as did those at Baton Rouge. The abrupt cessation of the honey flow was marked by the attempt of some colonies of bees to rob other colonies.

Nevada honey producers use U. S. grades.--On a recent trip to Nevada, G. H. Vansell, of the Pacific Coast Bee Culture Field Laboratory, Davis, Calif., found that the Nevada Honey Producers' Association is still selling comb honey under the U. S. grading rules, although they have encountered difficulty with the Pacific coast dealers, who usually set up their own specifications for marketing. The association, with headquarters at Yerington, is managed under both State and Federal direction through the office of the Farm Adviser. Mr. Vansell also found a decided tendency on the part of the producers to switch from comb to extracted honey. Production and marketing problems are reported to be less difficult with extracted honey.

IDENTIFICATION AND CLASSIFICATION OF INSECTS

Relative of pink bollworm intercepted.--Specimens of lepidopterous larvae associated with seeds and pods of Althaea nudiflora sent from Alma-ata, U. S. S. R., and collected at the plant quarantine inspection house at Washington, D. C., have been identified by Carl Heinrich as Platyedra vilella Zell. The species is related to the notorious pink bollworm.

Apelma brevis Johannsen from Cuba.--Larvae of this small midge (Ceratopogonidae) intercepted at Philadelphia and Boston in August, associated with pineapples in ship's stores from Cuba, have recently been identified by Alan Stone. This species was originally described from Hawaii in 1927 and reported as a troublesome pest, since the larvae living in the water at the base of the leaves broke the leaf tissue and allowed injurious bacteria to enter. This is the first record, so far as can be discovered, of the occurrence of this species in the New World, although it probably originated there. All Apelma species of which the habits are known breed in water held by leaves.

First report of Orgilus in Hawaii.--Specimens of parasitic Hymenoptera sent in for identification by O. H. Swezey, Honolulu, T. H., have been placed by C. F. W. Muesebeck as apparently representing two species belonging to the braconid genus Orgilus. Apparently no species of this genus has ever been reported from the Hawaiian Islands.

A grass bug at Arlington Farm, Va.--F. W. Poos, Arlington Experiment Farm, recently reported that last summer chinch bugs had been doing considerable damage at the farm on a creeping bentgrass that was being experimented with for golf greens. A number of specimens collected in September by F. F. Dicke, were submitted to H. G. Barber for determination and were identified by him as Blissus hirtus Montandon, a grass-feeding species in the Northern States and Canada. So far as known, this species does not occur on any of the grains and has not hitherto been reported as occurring south of Pennsylvania. It seems very probable that the species has been transported, either in the egg or nymphal stage, concealed in the soil about roots of grasses received for experimental purposes from various northern points, such as Pennsylvania and Canada.

INSECTICIDE INVESTIGATIONS

Apple-washing experiments well along.--C. M. Smith reports that the Division's investigators at Wenatchee, Wash., are making rapid progress in their examination of apples washed by various processes in cooperation with the Bureau of Plant Industry. Attention has been devoted to lead and fluorine residues, and the results to date show satisfactory removal of the lead by most of the procedures, but rather unsatisfactory removal of fluorine. The analyses for lead of eastern apples washed by the Bureau of Plant Industry at College Park, Md., are also nearing completion. At both locations the electrolytic method for determining lead has proved to be very convenient and highly satisfactory.

Chemical evaluation of rotenone-bearing plants.--H. A. Jones has recently completed the chemical phases of a study of the relationship between chemical composition and toxicity of a group of rotenone-bearing plants.

UNIVERSITY OF FLORIDA
3 1262 09312 2694

The entomological part of the work was done by F. L. Campbell and W. N. Sullivan, of the Division of Control Investigations. The former will present an account of the investigation before the Pittsburgh, Pa., meeting of the American Association of Economic Entomologists, to be held during the last week of December 1934. The best measure of toxicity proved to be a value for rotenone-like materials, exclusive of toxicarol, but no definite recommendation for the adoption of any particular criterion is being made.

Devil's-shoestring promising as insecticide source.--Examination of more than 300 samples of plants of the species Cracca virginiana, a common weed known as devil's-shoestring, has shown two samples to contain nearly 2 percent rotenone and given indications that several others will exceed this figure appreciably. These plants compare favorably with some samples of derris, and serve to renew the hope that this domestic species may become an agricultural crop and furnish cheaper insecticides to the consumer.

The insecticide anabasine found in native plant.--It has been found very recently that the roots of a plant from New Mexico, believed to be Nicotiana glauca, contain anabasine, an alkaloid similar to nicotine in chemical nature and insecticidal effect. This valuable insecticide has heretofore been found only in a Russian plant, and the finding of it in a native species may possibly lead to a larger and cheaper supply of insecticides.

---oOo---